

WHAT IS CLAIMED IS:

1. A method of load balancing in a terrestrial wireless communication system including an access node, the method comprising:

communicating data wirelessly between the access node and a plurality of terminals via a plurality of channels, wherein the plurality of terminals and the access node form a wireless local area network;

determining, at the access node, an overloaded channel from the plurality of channels; and

transferring, at the access node, a load from the overloaded channel to a less loaded channel of the plurality of channels.

2. The method of Claim 1, wherein the determining comprises:

calculating loads of each of the plurality of channels based on at least one of: the number of packets pending in each of the channels and bandwidths which are currently being used in each of the channels;

determining the overloaded channel from the plurality of channels based on the calculated loads; and

selecting a link from the overloaded channel.

3. The method of Claim 2, wherein the transferring is performed in case the quality of service level required for the selected link is met in the less loaded channel.

4. The method of Claim 2, wherein the transferring comprises swapping the selected link of the overloaded channel with a link of the less loaded channel.

5. The method of Claim 2, wherein the selecting comprises selecting the least loaded link from the overloaded channel.

6. The method of Claim 2, further comprising determining a received signal strength indication (RSSI) value in the less loaded channel and wherein the transferring is performed if the determined RSSI value is equal to or greater than that of the RSSI value of the selected link, or greater than a threshold RSSI value.

7. The method of Claim 1, wherein the wireless communication system comprises one of the following: a IEEE 802.11a/11b/11g network, a wireless local area network (WLAN), a wireless personal area network (WPAN), a general packet radio service

(GPRS) network, a global system for mobile communication (GSM) network, a code division multiple access (CDMA) network or a Bluetooth network.

8. The method of Claim 1, wherein the access node includes a plurality of access nodes, and wherein each access node performs the determining and transferring independently from each other.

9. A method of load balancing in a wireless communication system including an access point, the method comprising:

- providing a plurality of channels between the access point and a plurality of terminals such that the access point is in data communication with the plurality of terminals via the plurality of channels;

- determining an overloaded channel from the plurality of channels based on at least one of: the number of packets pending in each of the channels and bandwidths which are currently being used in each of the channels;

- selecting a link from the overloaded channel; and

- transferring the selected link to a less loaded channel of the plurality of channels based on at least one of: the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the less loaded channel.

10. A method of load balancing in a wireless communication system including an access point, the method comprising:

- communicating data between the access point and a plurality of terminals via a plurality of channels;

- calculating loads of each of the plurality of channels based on at least one of: the number of packets pending in each of the channels and bandwidths which are currently being used in each of the channels;

- determining an overloaded channel from the plurality of channels based on the calculated loads;

- selecting a link from the overloaded channel;

- selecting a new channel, to which the selected link is transferred, from the plurality of channels, wherein the new channel is less loaded than the overloaded channel;

determining the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the new channel; and

transferring the selected link to the new channel in case the determined RSSI value is equal to or greater than that of the selected link or greater than a predefined threshold RSSI value, and in case the quality of service level required for the selected link is met in the new channel.

11. An apparatus for load balancing in a communication system including an access point, comprising:

a control module configured to i) communicate data wirelessly between the access point and a plurality of terminals via a plurality of channels, wherein the plurality of terminals and the access point form a wireless local area network, ii) determine an overloaded channel from the plurality of channels and iii) transfer a load from the overloaded channel to a less loaded channel of the plurality of channels; and

a memory, in data communication with the control module, configured to store information to be used for the control module performing the load balancing.

12. The apparatus of Claim 11, wherein the control module and the memory are embedded in the access point.

13. The apparatus of Claim 11, wherein the access point comprises a multi channel medium access control (MC-MAC) based access point.

14. The apparatus of Claim 11, wherein the control module is further configured to i) calculate loads of each of the plurality of channels based on at least one of: the number of packets pending in each of the channels and bandwidths which are currently being used in each of the channels, ii) determine the overloaded channel from the plurality of channels based on the calculated loads and iii) select a link from the overloaded channel.

15. The apparatus of Claim 14, wherein the control module is further configured to transfer the load in case the quality of service level required for the selected link is met in the less loaded channel.

16. The apparatus of Claim 14, wherein the control module is further configured

to determine a received signal strength indication (RSSI) value in the less loaded channel and to transfer the load if the determined RSSI value is equal to or greater than that of the RSSI value of the selected link, or greater than a predefined threshold RSSI value.

17. A system for load balancing in a wireless communication system including at least one access node, each access node employing a plurality of channels, wherein each access node is configured to determine a load imbalance based on at least one of the number of packets pending in each of the plurality of channels and bandwidths which are currently being used in each of the plurality of channels, and wherein if there is an overloaded channel, the access node is configured to select a link from an overloaded channel, and transfer the selected link to a less loaded channel based on at least one of the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the less loaded channel.

18. A system for load balancing in a terrestrial wireless communication system including an access node, comprising:

- means for communicating data wirelessly between the access node and a plurality of terminals via a plurality of channels, wherein the plurality of terminals and the access node form a wireless local area network;

- means for determining, at the access node, an overloaded channel from the plurality of channels; and

- means for transferring, at the access node, a load from the overloaded channel to a less loaded channel of the plurality of channels.

19. The system of Claim 18, wherein the determining means comprises:

- means for calculating loads of each of the plurality of channels based on at least one of: the number of packets pending in the each of channels and bandwidths which are currently being used in each of the channels;

- means for determining the overloaded channel from the plurality of channels based on the calculated loads; and

- means for selecting a link from the overloaded channel.

20. The system of Claim 19, wherein the transferring means is configured to transfer the load in case the quality of service level required for the selected link is met in the less loaded channel.

21. The system of Claim 19, wherein the selecting means is configured to select the least loaded link from the overloaded channel.

22. The system of Claim 19, further comprising means for determining a received signal strength indication (RSSI) value in the less loaded channel and wherein the transferring means is configured to transfer the load if the determined RSSI value is equal to or greater than that of the RSSI value of the selected link, or greater than a threshold RSSI value.

23. A computer readable medium storing a program which performs a method of load balancing in a terrestrial wireless communication system including an access node, the method comprising:

communicating data wirelessly between the access node and a plurality of terminals via a plurality of channels, wherein the plurality of terminals and the access node form a wireless local area network;

determining, at the access node, an overloaded channel from the plurality of channels; and

transferring, at the access node, a load from the overloaded channel to a less loaded channel of the plurality of channels.